

Double Patenting Rejections

Claims 1-5, 7-9, 12-13 and 21 have been rejected under the judicially-created doctrine of obviousness-type double patenting in view of claims 1-5 and 10-12 of U.S.P. 6,499,893 in view of Umehara (previously of record) and Mouri et al. (U.S.P. 5,073,791). Claims 1, 6 and 12-16 have been rejected under obviousness-type double patenting in view of claims 1-2 of the '893 Patent in view of Umehara, Mouri and further in view of Yamada (previously of record). Claims 1 and 10-11 have been rejected under obviousness-type double patenting in view of claim 1 of the '893 Patent in view of Umehara, Mouri and Kubo (previously of record). Claims 1 and 17 have been rejected under obviousness-type double patenting in view of claim 1 of the '893 Patent in view of Umehara, Mouri and Kagayama (previously of record).

Obviousness Rejections

Claims 1-2, 4, 12-13, 17 and 21 have been rejected under 35 U.S.C. § 103 as being unpatentable over Mouri in view of Umehara. Claim 3 has been rejected under §103 as being unpatentable over Mouri and Umehara and further in view of Uji-Ie (previously of record). Claim 6 has been rejected under §103 as being unpatentable over Mouri in view of Umehara and further in view of Yamada. Claims 7-11 have been rejected under 35 U.S.C. § 103 as being unpatentable over Mouri and Umehara and further in view of Kubo. Claims 14-16 have been rejected under §103 as being unpatentable over Mouri in view of Umehara and further in view of Okino.

Applicant submits the following for traversing the rejection.

With regard to the §112, first paragraph rejection of claim 18, Applicant would direct the Examiner's attention to the exemplary embodiment of Fig. 3 and the supporting text at pages 25-26.

With regard to the double patenting rejections, Applicant submits that Umehara does not teach optical fixing, but only UV fixing, as indicated by the attached translation of the reference. As set forth in the translation, a first combination of visible light exposure, heating and UV fixing light provides a positive image. As the alternative, the visible light provides initial exposure followed by simultaneous heating and UV fixing light exposure to provide a negative image. No optical fixing is provided. Therefore, the first sequence lacks fixing by exposure to visible light because UV exposure is discussed. The second sequence lacks a sequential downstream process of visible light exposure, heating, and UV fixing. Even assuming *arguendo* that any visible light fixing occurs for the second sequence, the claimed sequence is not taught in Umehara since the last two steps are combined. Applicant would note that none of the secondary combinations including Yamada, Kubo and Kagayama make up for these deficiencies.

With regard to the obviousness rejections, Mouri does not specify that fixing source 22 is a visible light source, and Umehara would not make up for the deficiency.

In particular, Mouri specifically contemplates that multiple reactions occurring simultaneously leads to poorly controlled polymerization. Col. 1, lines 45-55. Therefore, any simultaneous application of stimuli (light and heat) as possibly suggested by Umehara, would defeat the controllability of the reactions. Accordingly, Mouri teaches away from a combination with Umehara, as the simultaneous stimuli would undermine a principle of operation of Mouri.

In view of the above, Applicant would submit that all rejections based on the primary combination of Umehara and Mouri should be withdrawn, leaving claims 1-4, 6-13, 15-18 and 21 patentable. Because no prior art obviousness rejection was set forth for claims 5 and 17, these claims are also allowable.

With further regard to the rejections over Uji-Ie, Yamada, Kubo and Okino, none of the secondary combinations make up for the primary deficiencies of Mouri and Umehara. Applicant would emphasize that Kubo and Okino each describe UV fixing light and not visible light as claimed. Further, contrary to the Examiner's contention, Uji-Ie may not be combined with any of Kubo, Okino, Mouri, Umehara because Uji-Ie uses a UV exposure for recording whereas the remaining references use a visible light for exposure. UV exposure at an inappropriate timing in Kubo, Okino and Mouri would preclude adequate image production. Therefore, Uji-Ie is incompatible with the base reference and other references, contrary to the Examiner's rationale.¹

Applicant notes that the Examiner also offers rebuttal to the prior arguments for rejection over Yamamoto. As Yamamoto is no longer being applied, Applicant would note that no counter arguments are being made at this time.

In view of the above, Applicant submits that claims 1-18 and 21 are in condition for allowance. Therefore it is respectfully requested that the subject application be passed to issue at the earliest possible time. The Examiner is requested to contact the undersigned at the local telephone number listed below to discuss any other changes deemed necessary.

¹ The Examiner appears to have mischaracterized arguments related to fixing characteristics of Uji-Ie.

AMENDMENT UNDER 37 C.F.R. § 1.111
U.S. Appln. No. 09/845,322

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Respectfully submitted,

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Date: March 23, 2004



[Translation]

Excerpt from Japanese Patent Application Laid-Open (JP-A) No. 57-5044

Page 16, upper left column, line 3 to lower right column, line 3

This treatment can be conducted by, for example, an apparatus shown in Fig. 4. When a positive image is formed, an optical system 3 irradiates imagewise visible light to a recording material, and the recording material is conveyed by a conveyer roller 1b, heated by a heater 4, and conveyed by a conveyer roller 1c. Then, the entire surface of the material is exposed to UV light from a UV light source 5. At this time, the heater 4' is not used. Meanwhile, when a negative image is formed, the optical system 3 irradiates imagewise visible light to a recording material. Then, the entire surface of the material is exposed to UV light from the UV light source 5 while the material is heated by the heater 4'. At this time, the heater 4 is not used. Thus, by appropriately using the heaters 4 and 4', a positive or negative image can be obtained. Moreover, when a negative image is formed, UV light irradiation and heating are simultaneously conducted, and therefore time necessary for obtaining one copy can be shortened. In Fig. 4, an arrow indicates the moving direction of the recording material, reference numerals 1a and 1d indicate conveyer rollers, reference numerals 2a, 2b, and 2c indicate conveyer belts, and reference numeral 6 indicates a reflector.

The mechanism of image formation according to the present invention is thought to be as follows. When a positive image is formed, by first imagewise irradiating visible light, a photoreducer in exposed areas of the material absorbs the visible light and extracts hydrogen from a hydrogen donor to form a reducing substance. Then, by heating the material at 80 to 150°C, the reducing substance decomposes a cobalt (III) ammine complex to generate ammonia. The ammonia irreversibly deactivates a color-forming component, i.e., performs image fixation. Then, by exposing the entire surface of the recording material to UV light, a photo-oxidizing agent in non-exposed areas becomes an oxidizing substance. The color-forming component, which forms color when oxidized, is oxidized by the oxidizing substance and forms an acid and a salt which accelerate color formation to form a dye. Thus, a positive image is formed in accordance with the image portion of an original document. Meanwhile, color is not formed in the exposed areas since the areas have been fixed. A chelating agent forms a chelate together with cobalt atoms, accelerates the decomposition of the cobalt (III) ammine complex in a chain reaction manner, and significantly increases fixation sensitivity. Moreover, when a chelating agent which has been described above and which, when coordinating with cobalt, forms a chelate that exhibits less absorption of visible light is used, the exposed areas are never colored. These areas are texture of a recorded object, and therefore an image with a low texture density and high contrast can be obtained.

The mechanism of negative image formation is essentially the same as above. However, in this case, non-exposed areas are fixed by ammonia generated by the decomposition of the cobalt (III) ammine complex. This phenomenon is thought to be as follows. The cobalt (III) ammine complex in the non-exposed areas obtains energy necessary for the decomposition by UV light irradiation and heating and decomposes. Ammonia generated by the decomposition fixes the non-exposed areas. Meanwhile, since the reducing substance exists in exposed areas, the cobalt (III) ammine complex rapidly decomposes due to UV light irradiation and heating. Ammonia escapes from the reaction system and cannot be involved in the fixation. Accordingly, exposed areas form color due to UV light irradiation, and therefore a negative image is formed.